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Research Paper

The Effect of Using Educational Tools with the Reciprocal and Inclusion Styles in Learning Some Basic Handball Skills for Female Students

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ABSTRACT

This research, conducted by Asst. Prof. Dr Nasreen Hassan Naji at the University of Kufa examines how the reciprocal and inclusion teaching styles impact the learning of basic handball skills among third-year female students in the Department of Physical Education and Sports Sciences. The study explores modern, interactive teaching methods as alternatives to traditional passive approaches, aiming to improve teacher-student interaction and skill development. It investigates the effectiveness of both styles in enhancing skill acquisition and determining the most efficient training method. The research was conducted from November 9, 2023, to March 1, 2024, in the university's sports hall, and aims to contribute to more effective physical education teaching strategies.

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1. INTRODUCTION

The educational process has evolved from traditional methods to more effective approaches, particularly in physical education, which has improved teacher-student interactions and development outcomes. Modern learning methods, like the reciprocal and inclusion styles, help enhance skill acquisition by promoting active participation and engaging students. Handball, as a globally popular sport, requires effective teaching strategies to develop essential skills. This research emphasizes the importance of integrating diverse learning styles to improve students' abilities, as traditional methods may not always suit learners' needs.[1] By using structured training methods, the study aims to increase variety and engagement in learning handball skills, ensuring more efficient and impactful education.

Research Problem

Teaching methods are crucial to the success of the educational process, shaping teacher-student interactions and learning outcomes. Traditional methods, like the command style, are commonly used in teaching handball skills but may not always be the most effective. This research aims to explore more progressive teaching styles, specifically the reciprocal and inclusion styles, to enhance skill acquisition. The study will measure and compare the effectiveness of these methods in teaching basic handball skills to third-year female students, aiming to identify the most suitable approach for optimal learning.

2. RESEARCH OBJECTIVES

1. To identify the effect of learning using the reciprocal and inclusion styles in acquiring basic handball skills among third-year female students in the Department of Physical Education and Sports Sciences.
2. To determine the most effective training scheduling method for learning basic handball skills among third-year female students in the Department of Physical Education and Sports Sciences.

Research Hypotheses

1. The reciprocal and inclusion learning styles have an impact on learning basic handball skills among third-year female students in the Department of Physical Education and Sports Sciences.
2. There is no significant superiority of either learning style (reciprocal or inclusion) in learning basic handball skills among third-year female students in the Department of Physical Education and Sports Sciences.

Research Fields

Human Field: Third-year female students in the Department of Physical Education and Sports Sciences for the academic year 2023-2024.

Spatial Field: The sports hall in the Department of Physical Education and Sports Sciences.

Temporal Field: The period from November 9, 2023, to March 1, 2024.

3. RESEARCH METHODOLOGY AND FIELD PROCEDURES

1. Research Methodology

The researcher adopted an experimental method with an equivalent group design, considered the most accurate for solving scientific problems. This approach is based on the law of the single variable, where differences between two identical situations can be attributed to a specific added element, making it ideal for the research problem.

2. Research Population and Sample

The research population consisted of **35 third-year female students** in the Department of Physical Education and Sports Sciences. The sample was divided as follows:

10 students were selected for the first experimental group, which used the reciprocal style.

10 students were selected for the second experimental group, which used the inclusion style.

8 students participated in the pilot study.

2.1 Sample Homogeneity

After dividing the sample into two groups randomly, certain variables were selected to ensure homogeneity and control individual differences among students, which could affect the research results. Statistical processing was conducted using the skewness coefficient to confirm sample homogeneity. Table (1) presents the results, indicating that the skewness values for the variables ranged between (±1). This confirms that the sample is normally distributed, as a sample is considered homogeneous when skewness values fall within (±1).

Table 1: Variables, Mean, Standard Deviation, Median, and Skewness Coefficient for the Two Experimental Groups

Groups	No.	Measurements & Tests	Unit	Mean	Median	Std Deviation	Skewness Coefficient	Significance
First Experimental Group (Reciprocal Style)	1	Height	cm	153.5	154	11.45	-0.13	Not Significant
	2	Weight	kg	52.62	54	4.35	-0.95	Not Significant
	3	Age	years	14.42	14	1.49	0.85	Not Significant
Second Experimental Group (Inclusion Style)	1	Height	cm	154.21	152	10.52	0.63	Not Significant
	2	Weight	kg	53.38	54	4.61	-0.4	Not Significant
	3	Age	years	14.22	14	0.99	0.67	Not Significant

2.1.1 Research Group Equivalence

To ensure valid comparisons, the research groups must be equivalent concerning variables related to the study. To attribute any differences in research results to independent variables, the researcher tested the equivalence of the research groups. The t-test was used to verify the equivalence between the two research groups in the following variables:

- **Dribbling skill**
- **Passing and receiving skill**
- **Shooting accuracy skill**

The results are shown in Table (2).

Table 2: Mean, Standard Deviation, and *t*-test value for Research Variables

Variables	Inclusion Style Group		Reciprocal Style Group		*t*-Value	Significance
	Mean	Standard Deviation	Mean	Standard Deviation		
Dribbling	4.93	0.79	4.54	1.01	1.21	Not Significant
Passing & receiving	34.85	3.33	35.29	3.64	1.57	Not Significant
Shooting Accuracy	3.32	0.57	3.63	0.49	1.29	Not Significant

The tabulated t-value at a 0.05 significance level with 28 degrees of freedom = 2.68

The results in Table (2) indicate no significant differences between the two experimental groups in the study variables. Since the computed *t*-values are smaller than the tabulated value, this confirms the equivalence of the research sample.

Equipment and Tools Used in the Research

1. Test selection forms for measuring skills.
2. LG 50-inch television.
3. Laptop computer.
4. Video camera.
5. Laser discs.
6. Stopwatch.
7. Handballs (10).
8. Markers and flags (10).
9. Small handball goal (dimensions 110 × 65 cm).
10. Electronic scale with measuring tape.
11. Colored paints and adhesive tapes for test markings.

Research Procedures

1. **Identifying the Basic Handball Skills Under Study**

To determine the basic handball skills for this study, the researcher referred to the official curriculum of the Ministry of Higher Education for the third-year handball course. The researcher also consulted specialized references and sources on handball. These skills were then presented to 15 experts and specialists in handball, testing, and measurement for validation. After collecting and analyzing the expert responses, the skills that received a 53.3% approval rate or higher were selected, as shown in Table (3).

Table 3: Basic Skills According to Experts' Opinions and their Relative Importance

No.	Basic Skills	Points	Relative Importance	Decision
1	Dribbling	142	94.66%	Accepted
2	Passing & receiving	141	94%	Accepted
3	Shooting Accuracy	145	96.66%	Accepted

Thus, the fundamental handball skills included in this study are:

1. **Dribbling**
2. **Passing and Receiving**
3. **Shooting Accuracy**

2.4.2 Selecting the Tests for Measuring Basic Handball Skills:[2]

Once the basic skills were identified by experts and specialists, it was necessary to determine appropriate tests for each skill. The researcher reviewed handball references and selected three tests for each skill. These tests were then presented to a panel of experts and specialists in handball testing, measurement, and training. After analyzing the expert responses statistically, the tests that received 53.33% approval or higher were selected, while tests that did not meet this threshold were excluded.

Tests Used in the Research

First Test: Continuous Dribbling Test in a Zigzag Direction for 20m

Objective: Measure the level of dribbling skill.

Tools: Handballs, stopwatch, five markers, handball court.

Performance Description: Five markers are placed on the ground in a straight line, each two meters apart. The start and finish lines are marked three meters from the first marker. The player stands behind the start line and, upon the signal, dribbles the ball while running in a zigzag pattern between the markers, going back and forth until crossing the finish line.

Scoring: The recorded time from start to finish is measured.

Second Test: Coordination and Passing Speed Test Against a Wall (30 sec) [3]

Objective: Measure passing and receiving skills.

Tools: Handball, flat wall, stopwatch.

Performance Description: The participant stands three meters from the wall and attempts to pass and receive the ball as many times as possible within 30 seconds.

Scoring: The number of successful passes is recorded by counting the number of times the ball is received.

Instructions: A recorder and referee must be present.

Third Test: Shooting Accuracy Test

Objective: Measure shooting accuracy.

Tools: Handball court, square targets (60 cm × 60 cm) fixed at the upper corners of the goal, five men's handballs.

Performance Description: The participant shoots from a stationary position behind the test line, ensuring their feet remain in contact with the ground and do not cross the 7-meter line. The goal is to hit the square targets positioned at the upper corners of the goal. Each participant gets four attempts—two on the right side and two on the left.

Scoring

1. If the ball enters the square target, the participant receives 3 points.
2. If the ball hits the frame of the square target, the participant receives 2 points.
3. If the ball enters the main goal but does not touch the square target, the participant receives 1 point.
4. If the ball misses the goal entirely, the participant receives 0 points.

Pilot Study

Before conducting the main experiment, a pilot study was necessary to test the research methods and tools, as well as to validate the scientific foundations of the tests. The pilot study was conducted on November 3, 2023, at 10:00 AM with a sample of eight third-year female students. The objectives were:[4]

1. Identifying obstacles encountered during the main experiment.
2. Ensuring the functionality of the equipment used.
3. Determining the time required for each test and the total testing duration.
4. Assigning tasks to the assisting team.
5. Verifying the smooth execution of the tests.

Findings from the Pilot Study

1. Organizing the tests properly during execution.
2. Ensuring the tests were appropriate for the research sample.
3. Confirming the logical sequence of the tests.
4. Verifying the suitability of the equipment used in the research.

Scientific Validity of the Tests

To determine the scientific reliability of the tests (validity, reliability, and objectivity) and their suitability for the research sample, the researcher ensured these principles were followed, despite the tests being standardized and widely used in multiple studies.[5]

1. **Test Validity:**

To ensure test validity, the expert judgment method was used, relying on the opinions of specialists to confirm that the tests effectively measure the intended skills.

2. **Test Reliability:**

The reliability coefficient was determined using the test-retest method on a sample of eight third-year female students on October 29, 2023. The tests were repeated after five days, during the pilot study on November 3, 2023. The obtained reliability coefficients are shown in Table 4:

Table 4: The obtained reliability coefficients

Test	Reliability Coefficient (%)
Dribbling Test	90%
Passing and Receiving Test	89%
Shooting Accuracy Test	88%

The tabulated correlation coefficient at a 0.05 significance level and 6 degrees of freedom is 0.70.

3. **Test Objectivity:**

Objectivity refers to the test being free from bias or subjective judgment. The researcher ensured the objectivity of the tests, despite their clarity and ease of understanding by the sample, by presenting them to a group of experts. The selected tests were those that received the highest approval rates from multiple specialists, ensuring their reliability and standardization.

Designing the Educational Program:

The researcher reviewed various scientific references and related studies to develop an educational program based on the reciprocal style and inclusion style of teaching. The program was reviewed by experts in handball, motor learning, and teaching methods. The researcher structured the program into the following sections:

1. **Preparatory Section**.
2. **Main Section**.
3. **Concluding Section.**

The program was designed and applied with the assistance of the subject teacher.

1. **Selecting the Study Topic**

The research variables were chosen based on the handball curriculum for third-year female students in the Department of Physical Education and Sports Sciences to address the lack of educational programs.

2. **Choosing the Suitable Study Venue**

The availability of a gymnasium facilitated the learning process, as it contained a handball court, making it suitable for implementing the program.

Structuring the Educational Program Based on the Reciprocal and Inclusion Teaching Styles

To implement the program effectively, the researcher structured the training skills accordingly. A questionnaire was presented to experts in handball to assess the suitability of the two teaching methods, and they unanimously approved their use.

Duration and Components of the Educational Units:

The program consisted of 16 educational units, each lasting 45 minutes, with two sessions per week over 8 weeks, totaling 64 educational sessions for the experimental groups. The total duration of the program was 1,440 minutes (24 hours), with each group receiving 720 minutes of instruction. Each educational unit was structured as follows:

Preparatory Section: 10 minutes
Main Section: 30 minutes

- Theoretical Part: 10 minutes
- Practical Part: 20 minutes

Concluding Section: 5 minutes

Table 5: Total Time Distribution

Section	Total Time (Minutes)	Percentage (%)
Preparatory Section	320	22.22%
Main Section	960	66.66%
Concluding Section	160	11.11%
Total	**1440**	**99.99%**

Main Experiment

1. **Pre-tests:** The pre-tests were conducted at 10:00 AM under controlled conditions, including equipment, time, and personnel. The tests took place at the College of Education for Women - Department of Physical Education and Sports Sciences, which provided a suitable environment. The researcher and assisting team administered the tests in a pre-determined order across different stations. The tested skills were dribbling, passing and receiving, and shooting accuracy.
2. **Implementation of the Educational Program:** Following the pre-tests, the program commenced on November 9, 2023, with two sessions per week per group. Each skill was covered over three consecutive sessions, with the last session completed on December 28, 2024.
3. **Post-tests:** After completing the program, post-tests were conducted in the same conditions as the pre-tests. Each skill test was performed immediately after completing the corresponding three training sessions. The same time, space, and tools were used, with assistance from the research team.

4. RESULTS AND DISCUSSIONS

Chapter Four includes the presentation of the results obtained after collecting data related to the pre-and post-tests for both research groups. The data was analyzed and discussed to determine the extent of improvement in learning the performance of the skills under investigation, aiming to achieve the research objectives and verify its hypotheses.

Presentation, Analysis, and Discussion of the Results of Both Research Groups in Pre- and Post-Tests for Acquiring Some Basic Handball Skills Among Female Students

1. **Presentation, Analysis, and Discussion of the Results of the First Experimental Group (Reciprocal Style) in the Pre- and Post-Test for Acquiring Some Basic Handball Skills Among Female Students**

Table 6: Mean, standard deviation, and calculated *t-value* between the pre-and post-tests for the first experimental group (Reciprocal Style) in learning some basic handball skills.

No.	Skill	Unit	Pre-Test	Post-Test	Effect Size	*t* Value	Significance
1	Dribbling	Points	4.54	8.73	0.62	17.74	Significant
2	Passing & receiving	Seconds	35.29	26.55	0.61	17.01	Significant
3	Shooting Accuracy	Points	3.63	6.11	0.57	15.38	Significant

From Table (6), the mean for the dribbling skill in the pre-test was (4.54) with a standard deviation of (1.01), whereas in the post-test, the mean increased to (8.73) with a standard deviation of (0.78). The calculated *t-value* was (17.74), which is greater than the tabulated value (2.45) at a degree of freedom (14) and a significance level of (0.05), indicating significant differences in favor of the post-test. The effect size for dribbling was (0.62), falling within the range of a large effect size. Similarly, the mean for the passing and receiving skill in the pre-test was (35.29) with a standard deviation of (3.64), while in the post-test, the mean decreased to (26.55) with a standard deviation of (3.83). The calculated *t-value* was (17.01), which is greater than the tabulated value (2.45), indicating significant differences favoring the post-test. The effect size for passing and receiving was (0.61), classified as a large effect size. For shooting accuracy, the mean in the pre-test was (3.63) with a standard deviation of (0.49), while in the post-test, it increased to (6.11) with a standard deviation of (0.62). The calculated *t-value* was (15.38), which is greater than the tabulated value (2.45), indicating significant differences in favor of the post-test. The effect size for shooting accuracy was (0.57), classified as a large effect size.

2. **Presentation, Analysis, and Discussion of the Results of the Second Experimental Group (Inclusion Style) in the Pre- and Post-Test for Acquiring Some Basic Handball Skills Among Female Students**

Table 7: Mean, standard deviation, and calculated *t-value* between the pre-and post-tests for the second experimental group (Inclusion Style) in learning some basic handball skills.

No.	Skill	Unit of Measurement	Pre-Test	Post-Test	Effect Size	*t* Value	Significance
1	Dribbling	Points	4.93	11.46	0.66	22.35	Significant
2	Passing & Receiving	Seconds	34.85	22.38	0.62	18.32	Significant
3	Shooting Accuracy	Points	3.32	8.95	0.65	21.34	Significant

From Table (7), the mean for the dribbling skill in the pre-test was (4.93) with a standard deviation of (0.79), whereas in the post-test, the mean increased to (11.46) with a standard deviation of (0.69). The calculated *t-value* was (22.35), which is greater than the tabulated value (2.045) at a degree of freedom (14) and a significance level of (0.05), indicating significant differences in favor of the post-test. The effect size for dribbling was (0.66), classified as a large effect size.

Similarly, for passing and receiving, the pre-test mean was (34.85) with a standard deviation of (3.33), while the post-test mean decreased to (22.38) with a standard deviation of (3.25). The calculated *t-value* was (18.32), which is greater than the tabulated value (2.45), indicating significant differences in favor of the post-test. The effect size for passing and receiving was (0.62), classified as a large effect size. For shooting accuracy, the mean in the pre-test was (3.32) with a standard deviation of (0.57), while in the post-test, it increased to (8.95) with a standard deviation of (0.76). The calculated *t-value* was (21.34), which is greater than the tabulated value (2.45), indicating significant differences in favor of the post-test. The effect size for shooting accuracy was (0.65), classified as a large effect size. The researcher attributes these results to the effectiveness of the applied teaching methods, which included carefully selected exercises tailored to the studied skills. According to Qasim Lazam and others, "Learning does not occur merely through repetition of movements and sports skills; training should be based on scientifically structured principles to ensure progressive skill development." [6]

Furthermore, skill acquisition is achieved through structured practice. As confirmed by Mohammed Abdel Ghani, "Training in movement or skill is realized through practice, repetition, and error correction, carried out under the supervision of a teacher or instructor. This is one of the fundamental steps in teaching motor skills. [7]

Presentation, Analysis, and Discussion of the Results of Both Research Groups in the Post-Test for Acquiring Some Basic Handball Skills Among Female Students

Table 8: Mean, standard deviation, and calculated *t-value* between the first experimental group (Reciprocal Style) and the second experimental group (Inclusion Style) in the post-test for learning some basic handball skills.

No.	Skill	Unit of Measurement	G1 (Reciprocal)	G2 (Inclusion)	Effect Size	***t*** Value	Significance
1	Dribbling	Points	8.73	11.46	0.66	6.65	Significant
2	Passing & receiving	Seconds	26.55	22.38	0.62	5.33	Significant
3	Shooting Accuracy	Points	6.11	8.95	0.65	3.98	Significant

The researcher attributes the better performance of the second group (Inclusion Style) to the effectiveness of this method, which allowed for greater direct interaction between the learner and the educational program, enhancing motivation and facilitating better skill acquisition. According to Zahir, "student performance and achievement are linked to the teaching method used." [8] Moreover, the structured design of the Inclusion Style created a stimulating learning environment, increasing motivation and engagement. This aligns with Hila's argument that "effective planning for student learning should be a scientifically structured process based on psychological principles, providing challenges, excitement, and enjoyment." [9] The use of educational technology provided learners with feedback through diverse stimuli, helping them acquire deep and useful information about the target skill. This supports the concept of "super motivation," where human potential is unlocked when engaged in activities, they are passionate about. [10]

5. CONCLUSIONS

In light of the results obtained, the researcher concluded the following:

1. The two teaching styles (reciprocal and inclusion) have a positive effect on the learning acquisition process of dribbling, passing, receiving, and shooting accuracy skills in handball.
2. The inclusion style surpassed the reciprocal style in its impact on the learning acquisition process of dribbling, passing, receiving, and shooting accuracy skills in handball.

6. Recommendations

The researcher recommends the following:

1. Emphasizing the use of the teaching styles applied in the study (reciprocal and inclusion) in the learning acquisition process for teaching basic handball skills.
2. Emphasizing the use of the inclusion style in learning dribbling, passing, receiving, and shooting accuracy skills in handball.
3. The necessity of applying other teaching styles in different sports while selecting the appropriate style based on the student's abilities and motor skills.
4. Expanding the use of teaching styles across various educational levels.
5. The necessity of using images and illustrations in physical education lessons due to their significant importance in enriching the learning process and linking auditory and visual senses to accelerate motor skill acquisition.
6. Conducting similar studies on age groups not covered in the current study for both male and female students.

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